

**ABSTRACT**  
**COMPENSATING FOR POLARISATION MODE DISPERSION IN OPTICAL**  
**TRANSMISSION FIBRES**

5       Compensating for polarisation mode dispersion in a birefringent optical trans-  
mission fibre is achieved by controlling the birefringence of the fibre. The dif-  
ference in group velocity of the orthogonal polarisation states of an optical  
signal transmitted over the fibre is monitored to generate an error signal repre-  
senting the difference. The birefringence of the fibre is adjusted accordingly  
10       to minimise the difference and thereby provide dynamic compensation. Bire-  
fringence control may be achieved by a non-linear fibre grating written into  
the fibre to impose a differential time delay. The fibre may be a side hole fibre  
(SHF), a holey fibre (HF), a photonic crystal fibre (PCF), or any other suitable  
microstructure fibre. The fibre may have stressing rods, may be tapered along  
15       its length and may be controlled electrically, mechanically, acoustically or  
thermally by spaced heating elements.